The Green Challenger

Official Newsletter of the Willunga Hillsface Landcare Group

Willunga Hillsface Landcare Group

Working towards a healthy, vibrant and sustainable Willunga Basin

Autumn 2014

Soil security on the political agenda

Soil security refers to the maintenance and improvement of soils worldwide so that they can continue to provide food, fibre and fresh water, contribute to energy and climate sustainability and help to maintain biodiversity and protect ecosystem goods and services.

It is a realisation that soil has an integral part to play in addressing the major existential issues facing the world today, and in fact 'soil security' is, and has to be recognised as, one of those issues.

When an international coalition of scientists got together to form the Soil Carbon Initiative, convened by the United States Studies Centre and the Faculty of Agriculture and the Environment at the University of Sydney in early 2011, they realised that carbon may be part of a solution to climate change but 'soil security' itself is the keystone issue.

Since then discussion has widened in an attempt to bring policy on soil security in line with that on food and water security.

A one-day meeting was held in Washington DC in September 2011, and in April 2012 the Australian government held a workshop on soil security at the UN in New York in relation to the Rio+20 negotiations.

It was hosted very ably by the Australian Ambassador to the UN, Gary Quinlan

The University of Sydney held a one-day symposium on this topic in July, which was very well covered by the media.

Speakers included Rattan Lal and Johan Bouma.

A short symposium was organised during Global Soil Week in Berlin in late November, at a meeting organized by the Institute for Advanced Sustainability Studies in Potsdam, Germany, and its international partners

Soil science has been searching for a grand narrative that plays out globally, soil security provides that, and places soil scientists in a key position for contributing to the earth's future sustainability.

Our colleague Robert Hill, former environment minister and UN ambassador, has been integral to the organisation of all of these meetings.

The first global conference on soil security is tentatively planned for April 2014.

A paper explaining the concept further has been submitted to a global policy journal.

Soil security is more than simply soil quality or soil health and currently research is focussing on its scientific, economic, social and policy dimensions and how they can be quantitatively evaluated.

The Australian government has played a key role in bringing soil security to world attention.

Both Kevin Rudd and Bob Carr, as foreign ministers, have been briefed on the subject.

Prime Minister Gillard appointed ex-Governor-General Michael Jeffrey as the official national advocate on soil, showing that soil policy has reached a level of importance in government circles.

Grass roots movements like *Carbon Farmers*, have brought soil to the national attention.

We are fortunate at the present time to have advocates of great stature like Michael Jeffrey, Penny Wensley and Robert Hill.

By Professor Alex McBratney and Andrea Koch

http://www.abc.net.au/news/2014-03-23/alex-mcbratney-andrea-koch-soil-matters/5332762

Earth Time

"I think the difficulty in environmentalism today resides in the way we have framed the issue… Often the arguments have pitted people against each other; jobs and profit versus environmental protection, clearcut logging versus parks, human beings versus spotted owls. In every battle that is resolved, there is always a loser or losing side, but when we are discussing the future of our children or grandchildren, we can't afford to have losers."

Quoted from: 'Earth Time' by David Suzuki, pp260-261

Soil is alive. It contains countless varieties of microbes, fungi and bacteria that help make minerals and chemicals available as plant food. Green Options Media

Editorial

Our Annual General Meeting was held on 13th October, 2013 at the Environment Centre.

Marg Morris chaired the meeting and welcomed a small gathering of about 15 people.

President, John Campbell mainly spoke about the total area the group has planted and the interesting bird survey that was performed earlier in the year.

Marg gave the Treasurer's report and Martin Weidenberg from the NRM chaired the meeting whilst the committee was elected.

Elections over, our guest speaker, Greg Butler did an excellent Powerpoint presentation and fielded questions from the floor. If you missed it, then you missed a good one. He also did a brief biochar demonstration without setting the place on fire!

A light supper was appreciated by all. Paul McKenzie made a sound recording of the talk which is available in MP3 format for anyone that's interested. *My contact details are on the back page.*

I have been reading a book by Masanobu Fukuoka called **"The road back to nature"** which I found very interesting. In one part of the book the author tells about a visit he had from a young Australian who gave him some Guavas. When cut open he is horrified to find they have fruit fly maggots in them.

This discovery was very important because Japan at the time this book was published, 1996, was fruit fly free. This incident caused quite a stir, but as the story goes on the part that really horrified me was the approach used by the U.S. to prevent entry of the medfly from the Caribbean Sea area. They created a broad million-acre line of defence along the Mexican and Guatemalan borders over which two helicopters constantly sprayed organochlorine insecticides. Wow. I'm glad I didn't live anywhere near that operation!

A Community **Meet and Greet** evening held at The Environment Centre on Monday 24th March was well attended.

Representatives from local groups were invited to give a short description of their group's activities, either verbally or with the aid of the data projector. Wayne Lawrence represented our group with a Powerpoint presentation of some of our achievments. It was suggested that this could become an annual event to help keep the groups up to date with each other's work.

Whilst surfing the net for stories related to Landcare I came across **Outcomes Australia**, which is a not-for-profit organisation for change. It is a collaboration of eminent Australians who are dedicating time and expertise on a pro-bono basis to deliver solutions for the greater good. Their purpose is to ensure that Australia has optimal solutions to problems that impact on the entire community directly, or indirectly.

Soils for Life is a non-profit non-government Registered Environment Organisation, chaired by Australia's former Governor General, Major General The Honourable Michael Jeffery, AC AO(Mil) CVO MC (Retd). The organisation has deductible gift recipient (DGR) status, and an **Outcomes Australia** Programme.

Soils for Life objective is to facilitate positive and sustained change in how the Australian landscape is managed to ensure a thriving natural environment for the benefit of all Australians.

To my way of thinking, this is the direction that all farmers should be heading in. Articles, case studies and webinars are available for viewing through their website: http://www.soilsforlife.org/ and they can also be followed on Facebook and Twitter.

The true meaning of life is to plant trees, under whose shade you do not expect to sit.

Nelson Henderson

Happy Birthday Landcare!

As the Landcare movement celebrates 25 years, the two bodies who pushed for its creation are challenging governments and communities to get behind the programme once again.

The National Farmers Federation and the Australian Conservation Foundation called for a 'new decade of action' on Landcare, at a ceremonial tree planting at Braidwood, east of Canberra on Friday.

NFF chief executive Matt Linnegar and ACF CEO Don Henry, used the same spade used by then prime minister Bob Hawke to launch the Landcare movement back in 1989.

The uncommon alliance between the two groups threw significant weight behind the pitch for a Landcare movement, and they hope that renewing that call in the movement's 25th year will put the spotlight on the challenges facing the Australian landscape, and Landcare's ability to make a difference.

The NFF and ACF want governments, as well as the farming and conservation communities, among others, to re-commit to Landcare and the work done by farmers and volunteer groups to revegetate and restore landscapes, and combat pests and weeds.

While they're keen for more government support, the National Landcare Network's chairman David Walker says that means investing in people, like the old local Landcare co-ordinators, who worked with local groups to help get projects off the ground.

The Braidwood property that hosted Friday's event belongs to committed Landcarers Geoffrey and Sally White, who describe the revegetation and rejuvenation of their sheep grazing property as their greatest achievement.

I've edited this. The full story is at: http://www.abc.net.au/news/2014-03-21/landcare-celebrates-25-years/5337540

Brian

Sequestering carbon in soils in grazing systems

Reference: 2014SC056

Applicant: Department of the Environment

Status: This methodology proposal is open for public consultation until 6 May 2014. For information on how to make a submission, please visit the methodologies page.

Description of methodology proposal

The methodology proposal applies to soil carbon sequestration projects in grazing systems and relies upon direct measurement of soil carbon to estimate sequestration. It sets out instructions for undertaking projects and estimating the resulting abatement.

Under the proposal, projects can be carried out on land that is either under permanent pasture, or that is converting to permanent pasture as part of the project. The methodology proposal sets out criteria that projects must fulfil before they will be deemed eligible and specifically excludes some activities. For example, some types of tillage are not covered by this methodology as they would result in significant greenhouse gas emissions that would undermine soil carbon sequestered through the project.

Within these broad parameters, project proponents can choose to implement any set of land management activities to build soil carbon. This set of activities must include at least one new management activity. Activities can include, but are not limited to: converting from cropland to permanent pasture, changing pasture species composition or changing grazing patterns.

Factors such as soil type, climate, management history and the type of activities proposed all influence the potential for soil carbon sequestration at a given site. There is no guarantee that any one or more of the eligible activities will build soil carbon at any particular project site.

The methodology proposal encourages proponents to research proposed management strategies and seek expert advice on what course of action will best suit their project site. Project proponents should undertake appropriate due diligence on the financial costs and any potential returns of undertaking a project prior to submitting a project application.

Proponents must estimate sequestration by measuring changes in soil carbon stocks in accordance with the methodology proposal. The methodology proposal, and associated guidelines, set out a process for soil sampling and analysis. Proponents must also account for other relevant greenhouse gases emitted as a result of the project in calculating net abatement.

Under the proposed methodology, projects can be implemented on all farms that meet the eligibility criteria however it is not likely to be cost effective to adequately sample very large farms in areas where rates of soil carbon sequestration are low.

Methodology Documents

- Methodology proposal – Sequestering carbon in soils in grazing systems (PDF - 2.21 MB)

Appendix A – CFI Soil sampling design method and guidelines (PDF - 774 KB)

Appendix B – CFI Soil sampling and analysis method and guidelines (PDF - 739 KB)

Appendix C – Emission Factors and Parameter Tables (PDF - 250 KB)

Contact

- Email: Domestic Offsets Integrity Committee secretariat doic@environment.gov.au

http://www.climatechange.gov.au/reducing-carbon/carbon-farming-initiative/methodologies/methodology-proposals/sequestering-carbon-soils-grazing-systems

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"A nation that destroys its soils destroys itself. Forests are the lungs of our land, purifying the air and giving fresh strength to our people."

Franklin D. Roosevelt

"The earth will not continue to offer its harvest, except with faithful stewardship. We cannot say we love the land and then take steps to destroy it for use by future generations."

Pope John Paul II

Clean Carbon, Wirra Wirra and the Adelaide & Mt Lofty Natural Resources Management Board bring you a Field Day

'Fit-for-purpose' Biochar in Vineyard and Winery Businesses

at Wirra Wirra Winery

McMurtrie Rd., McLaren Vale. Phone: (08) 8323 8414

on Thursday, 8th May

Start time unavailable when going to print

There will be an on-site pyrolysis demonstration of 150kg/hr continuous flow biochar machine using 2 feed stocks: winery waste (skins/seeds) and green waste (tree pruning, weeds). The Biochar machine will be left on-site for the following week to make quantities of biochar suitable for vineyard field trials

How tree huggers can save forests

While hugging a tree sounds relaxing, it's harder than you might think - especially when the tree is 20 storeys high and 3 metres wide, it's hot as hell, and you're swatting away swarms of sweat bugs.

There's a hard-headed reason behind that tree-hugging work: you can't properly manage what you don't measure.

Lack of reliable information about so much of the world's forests is part of why we're still losing forests so fast. Deforestation contributes an estimated 10-15% of all human-caused greenhouse gas emissions. Forests and the clouds of water vapour that they produce also help to cool the planet.

Without an army of scientists, how can we do a better job of counting the trees and carbon in our forests? We decided it was time to test if the locals could put scientists out of a job - and it turned out we weren't alone.

Why bother counting tree carbon?

Half of a tree's dry weight is made up of carbon. Using simple field measurements, such as girth measured at 1.3 metres above the ground, is the surest way without cutting the tree down to estimate its weight and its value in locked-up carbon.

It's labour-intensive work for scientists like us in muddy boots, measuring hundreds of trees in each hectare, usually in remote, logistically challenging terrain. All of that makes it an expensive process, and therefore hard to do on the scale we need to properly account for the carbon value of our forests.

Fortunately, we're also getting better all the time at measuring forests from space using satellites. Only last week, a team of US researchers (including from Google) published the first high-resolution global map of the world's forests, which revealed that we are continuing to cut down forests around the world much faster than we're regrowing them.

Published in the journal Science, the map is made up of more than 650,000 satellite images, making it possible to search for particular locations and then zoom in down to a 30-metre resolution to see where forests have been lost. *(The map is available as part of this article at the address at the end of this article.)*

> Every 27 tonnes of carbon sequestered biologically in soil represents 100 tonnes of CO_2 removed from the atmosphere.
>
> Dr Christine Jones

For the most reliable results, counting trees and the carbon stored in them requires old-fashioned sweat and techniques used for a century.

Growing money from trees

One of the ways that it's possible to make money by leaving forests standing is through the United Nations' Reducing Emissions from Deforestation and forest Degradation programme REDD+, which aims to reduce forest carbon emissions in developing countries by paying to preserve the carbon stored in these forests.

That's easier said than done. When REDD+ was first framed in 2007, it was heralded as "the most promising opportunity for reducing deforestation, conserving forests and contributing to climate change mitigation". Now, enthusiasm for the policy has dwindled.

The UN programme has largely stalled due to stringent Monitoring, Reporting and Verification requirements, that are beyond the capacity of most developing countries.

Unfortunately, less than 10% of the 99 developing countries eligible to be part of the REDD+ scheme have the in-house expertise or the resources to employ outside experts to conduct such field inventories. As a result they cannot reap the economic benefits of protecting forests.

The idea of bridging this gap by engaging forest-dependent communities to monitor carbon in their own forests has become more popular. But can local people collect data reliably, matching the kind of results that scientists get to meet the stringent Monitoring, Reporting and Verification requirements?

Can locals beat scientists at their own game?

Our team of scientists spent seven months in the YUS Conservation Area on the Huon Peninsula of Papua New Guinea, a rugged, road-less mountain region where people depend on their forest for building material, food and fuel.

The participants in our study live in three of about 30 communities that have achieved a remarkable milestone for conservation.

Collectively these PNG communities have pledged 74,000 hectares of primary forest to protect the endangered Matschie's tree-kangaroo from overhunting. The Matschie's tree-kangaroo is the largest animal in this forest and was previously threatened by overhunting. In 2009 villagers pledged to protect the important cultural icon.

Also in 2009, the YUS Conservation Area became the first (and only) area protected under the PNG's Conservation Area Act 1978. Thus, not only can community-led forest monitoring provide local livelihoods in exchange for for-

est protection, it will help ensure the protection of endangered species into the future.

The 12,000 villagers in the YUS area currently have limited options for earning a wage. There is therefore a risk that they will resort to the old school livelihood options provided by extractive industries at the cost of inevitable environmental degradation and cultural dislocation.

We trained six member teams from three communities to perform forest-carbon assessments using survey tapes, GPS units and laser-rangefinders. None of this equipment had been previously encountered by the villagers.

These teams then undertook self-led forest-carbon surveys in 41 randomly selected survey plots. Once the community surveys were complete, we spent three months re-measuring the same plots. We double-checked all 4211 field measurements recorded by the community teams from lowland forest at 50m altitude to cloud forest at 3000m.

Our results confirm that, with only three days of training in unfamiliar and complex techniques, people with little formal education can produce real-world field data as reliably as experts.

In some instances, communities performed better than scientists. For example, marking out a rectangular plot area is a difficult task in dense forest on steep terrain and the plot area was more accurate in the community surveys. This may seem trivial, but errors in plot area are directly proportional to errors in final carbon estimates.

We further found that the biggest source of error in forest-carbon estimates is from imprecise measurement of large trees. Though trees of more than 50cm in diameter only constitute 14% of the trees measured, these trees were responsible for 85% of the total error in forest carbon estimates.

Community results with global significance

We're currently preparing our findings from PNG to submit to a peer-reviewed journal. Our results have since been independently backed up by an international group led by Finn Danielsen, published in the latest edition of the journal Ecology and Society.

Their study – which was the first-ever quantitative study of REDD+ community participation – demonstrated that local people from Indonesia, China, Laos, and Vietnam using simple tools like sticks and ropes could generate forest-carbon data on par with professional foresters using high-tech devices.

The study also found that nearly half of REDD+ projects still don't work with communities in gathering data on forests. So there is huge, untapped potential for local communities to earn money from protecting their forests, rather than that REDD+ funding ending up with outsiders.

As the latest UN climate talks in Warsaw come to a close, with little sign of major progress, this is at least a glimmer of hope.

For communities considering whether to forego cutting down their forests, locally-led forest monitoring offers a potential win-win-win for people, forests and our climate.

Authors: Michelle Venter, PhD Candidate at James Cook University. Michael Bird, Professor, geochemistry and environmental change at James Cook University

http://theconversation.com/how-tree-huggers-can-save-forests-with-science

Letters, emails or feedback of any kind on anything in this Newsletter would be very welcome. If you have something you would like to see published, please contact me.

Infra red technology to help protect crops

Professor Christian Nansen tells Tara De Landgrafft about some of the latest technology that science hopes will help protect farmers crops.

Drones, infra-red lasers, sensor controlled seekers. It all sounds pretty high tech.

But it's actually just the reality of modern day farming, and it could be coming to a paddock near you, if it hasn't already.

Professor Christian Nansen says the technology could not only save farmers quite a bit of money, it could also entice young people into the industry as well.

At the moment, Professor Nansen, along with his colleagues at the University of Western Australia are developing rapid and non-destructive ways to assess the quality of food and broad acre crops.

It involves lasers that can determine if a crop has been attacked by pests or disease long before the naked eye can see a problem.

And he says the technology has a number of applications and could revolutionise modern farming.

"We're very interested in finding out, can we, in a large paddock of canola for instance, can we find the parts that have been infested or about to be infested with diamond back moth or cabbage aphids so then we can pin point where the insecticide applications will be needed," he says.

"So this is one way of reducing the chemicals and reducing the need for driving around and scouting so saving fuel, saving time."

Audio: Infra red technology to help protect crops (ABC Rural)

http://www.abc.net.au/news/2014-02-27/infra-red-nansen/5289522

Lost in the paddock:

Australia is flying blind on farm ownership. Debate about who owns Australia's farmland is often expressed in crude and narrow ways, and not just on talkback radio. Take last year's leaders debate at Rooty Hill during the final week of the election campaign in which Kevin Rudd declared himself "old fashioned" on the issue of foreign access to Australian land.

The problem is the question of "farmland" has come to mean many different things to many different interest groups. It now exists as narrative shorthand for diverse moral panics about the future of food, the nation's water resources, the environmental effects of coal seam gas, the political economy of foreign investment (especially from China), and the power of big agribusiness.

Dig into this debate, and what emerges is a sense of middle Australia fearing for the fortunes of "mum and dad" farmers.

Farm businesses are in decline, but land is important

Of course, there is more than a little bit of truth in such fears. As the number of farm businesses in Australia continues its century-long retreat, it is fair to ask whether the decline has reached a critical tipping point. Are some agricultural industries under threat because they no longer have the required numbers of farmers to sustain their futures?

Succession problems within families are a huge issue, with a study of the Corangamite watershed in Victoria indicating more than 50% of properties are likely to change hands within a decade. And the 'Lock the Gate Alliance' highlights the pressures on farming from an array of fronts. The question is where to start unpacking these diverse debates.

One of us (Erin Smith) pursued this during PhD research. When farmers in rural Victoria were asked about their attitudes to owning land, they talked at length about the vital role this asset played in their lives and livelihoods. This was in spite of the fact that for many farmers, leasing (rather than owning) farmland is a clear option that could potentially provide greater operational flexibility and free up capital.

Analysing farmer responses to these questions revealed the ownership of land represented a desire to manage risk and uncertainty in an increasingly unpredictable world. For these farmers, owning land was a safe haven in their business and domestic worlds.

Data problems abound

So if we conclude that land is vitally important for family-based farm establishments, it might logically follow that there would seem to be strong reasons for governments to monitor the ownership of agricultural land.

Surprisingly, Australia does not have readily assessable national data on this topic. In fact, it wasn't until 2010 that a national longitudinal survey of foreign interests in land and water was implemented. This survey has been widely criticised for its limited scope and, consequently, the distorted picture the data provide about ownership. Robust data at a finer scale is what's required if we are to better understand the issues.

The states have Constitutional powers over land, meaning each jurisdiction operates its own land titles registers and spatial information offices. Less than two decades ago, these systems were paper-based. As each state computerised their operations, they did so in different ways. These differences in data capture and presentation make it difficult to construct national perspectives on this vital issue.

The first effort to merge these systems and create national perspectives on rural land ownership was published in 2012. This study found that 16.8% of land in the agriculturally productive area of rural Australia changed hands between 2004 and 2008. This gave an annual "churn rate" of 4.25%.

Agricultural land in densely settled areas had a higher propensity to change ownership, and as the drought wore on in the eastern states during this period, the overall rate of change slowed. In the heartland grazing and cropping belts, rates of change were generally low and more than half of all buyers were existing landowners in the same shire, indicating the key role of local farm aggregation in rural restructuring.

The database behind these estimates provide records of the entities that have legal title over land at any one time, generating a vehicle for tracking individual owners at a national scale. But when this project concluded in 2012 the reins were not taken up elsewhere in the bureaucracy, and so its findings have not been updated.

Even on the hot-button issue of foreign ownership of agricultural land, bureaucratic will and political enthusiasm appear laggard. National farm lobby groups have complained that you can't have a sensible discussion about this issue in the absence of reliable, comprehensive and up-to-date facts.

The ownership of agricultural land is an issue of vital consequence to Australia's farm sector. Talk to farmers, as we have, and they quickly and cogently tell you about its importance. It is a black mark on national debate that this reality is not translated into public action. Informed national debate on these topics requires data sets that clearly document who owns agricultural land, and at what rate it is changing hands.

Authors: Erin Smith, PhD Candidate at University of Sydney and Bill Pritchard, University of Sydney.

Article copied from: theconversation.com/lost-in-the-paddock

Regreen The Range Report

Well it has been another poor season in relation to rainfall events this spring and summer. Apart from the nearly 40mm of rain that fell on one day in February, the rain received in Willunga from October to February (81mm) has been nearly half the long term average (152mm).

In fact over the last ten year period there have only been two years where we've received above the long term average and if one rainfall event is removed from the rainfall data for February 2011 (43mm) there is only one year in the past ten years where we have received above the long term average. Over the same ten year period we have received above the long term average rainfall over the winter and early spring months for six of the ten years.

Direct seeding

As the group conducts the direct seeding over the winter months, good germination rates are achieved due to the good rainfall but the lack of rainfall over the mid to late spring and summer period results in the newly germinated direct seeding suffering fatal water stress.

On properties where the group has undertaken predominately all planting of propagated plants the success rates, where there is limited kangaroo damage, have been very good.

When the Landcare Group undertakes its revegetation program the management of risk is a determining factor in the success or otherwise of the program. Over a number of years now the success of the direct seeding component of the program has suffered substantial losses due to the lack of rainfall over the late spring and summer months.

When the seasons are favourable for the success of direct seeding large areas of land can be revegetated very cost effectively. The losses being incurred over the past few years, due to the lack of rain, are now beginning to outweigh the advantages of direct seeding being relatively cheap to undertake. This situation is not only disappointing to the Landcare group but also to the landholders as well who wish to see revegetation on their properties.

Over the coming years the Landcare group will trial reducing the amount of direct seeding it undertakes and increase the amount of propagated tube-stock it plants. This will result in less area being planted for the same amount of money, but if acceptable survival rates are able to be achieved then the Regreen The Range program will continue to produce satisfactory results at good value for money.

Wayne Lawrence

WILLUNGA
Environment Centre INC

Supported by Adelaide & Mt. Lofty Ranges Natural Resources Management Board

18 High St., Willunga. Phone: 8556 4188

Open Mon.–Fri. 10 am – 3 pm, Sat. 9.30 am – 1.30 pm.

COMING EVENTS

17th & 24th May: Wildlife/ Nature Photography Workshops over two full days run by Colin and Gillian Rayment

Free supper provided

We are using the notice board on the outer Eastern side of the building and public and community groups are invited to use the board. Please drop your pamphlets, etc. into the centre for display, and start looking to see what is there!

Registration essential: info@willungaenviro.org.au to register

The carbon content of Australia's soil has been mapped in incredible detail for the first time

Carbon levels have been measured across every 90 square metres of the country using soil sampling data and some sensory technology and modelling. Lead researcher on the CSIRO project, Dr Raphael Viscarra Rossel, says this is the first time Australia has ever had a national benchmark for carbon levels in the soil. "For the first time, we were able to test baseline levels for soil carbon across the country," he said. "It gives us not only the total amount we have as a country as a whole, but also for each of our states and territories, for each land use type and for different vegetation classes."

Dr Viscarra Rossel says this map will help measure the success of future climate change policies. "This map provides the first ever baseline from which future changes as a result of, for example, management of climate change will be able to be measured," he said. He says the map will also help farmers and other landowners who want to pursue carbon sequestration through programs such as the Carbon Farming Initiative. "It will help to offset carbon together with other data on land management practices," he said. "Because the mapping is done at 90 square metre intervals, it will help farmers know what they might expect in their regions, in their landscapes and in their soils. "But they may need further sampling to know more about local areas, individual farms or paddocks.

http://www.abc.net.au/news/2014-03-19/csiro-carbon-map/5331368

An audio file is available at this site too

Willunga Hillsface Landcare Group

P.O. Box 215, WILLUNGA, S.A. 5172

Meeting dates vary, but are usually held on Mondays monthly at 7 p.m. in the Willunga Hub, cnr. St. Peters Terrace, Willunga.

All members are welcome to attend these meetings.

President:	John Campbell	8556 2916
Chairperson:	Kate Parkin	8323 9275
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If you would prefer to receive your copy in PDF format (via email) please let me know at this address: 2garfy94@gmail.com.

Willunga Hillsface Landcare Group

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Willunga Environment Centre
18 High Street, Willunga

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Please return this form together with your joining or renewal fee to:
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Do you wish to continue receiving the "Green Challenger" (Y/N)

Our thanks to Leon Bignell, MP, local Member for Mawson for printing this newsletter.